"SPEECH DEVELOPMENT"

"A thesis presented to the Faculty of the Graduate School of the University of Pennsylvania in partial fulfilment of the requirements for the degree of Doctor of Philosophy."

By

HERBERT BALDWIN MOYER

December, 1911.

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Introduction

This thesis is a record of the observations of and experiments made on E. D. G. M., the writer's daughter, as a subject, and an attempt to show the development of speech and to digest the material into pedagogically interesting and instructive conclusions.

The record extends over a period of more than five years, beginning about March, 1903, the ninth month, and ending June 24, 1908, at the completion of the sixth year.

Several gaps occur in the records, caused by the absence of G. from home. Not until November, 1904, did the idea occur of working this subject into a thesis. After this date there occurs a gap of only one month, August, 1907.

Such studies as this have frequently been made by various observers; usually, however, they did not continue their observations beyond the third year (29:133), perhaps because of the great labor involved (73:62.) This thesis was planned to ascertain the vocabulary at the end of the sixth year, when school life usually begins, and to show the stages in development.

A table is arranged to show the increase each month in total vocabulary, parts of speech, etc. From this is arranged a chart, on which curves are plotted showing graphically the growth of the several parts of speech.

The enunciation of G. shows a gradual development and improvement up to about the thirtieth month. After the thirty-sixth month a marked deterioration begins, lasting throughout the period of the observations (8:156). This deterioration became especially noticeable when G. began to attend the Kindergarten. Adenoids, which were removed in the eighty-first month, may have played an important part in this deterioration.

The vocabulary is largely concrete, as indicated by the preponderance of nouns, which comprise most of the early words

(48:120). However, abstract terms are used intelligently, especially toward the latter part of the period observed (19:364).

The method of determining the vocabulary (33:5), was to record only those words used spontaneously by G. (11:106), rejecting all those due to immediate imitation (7:905). When a word has been intelligently used several times, it probably becomes a permanent part of the vocabulary. If this is so, the method of counting only those words used by the child during the last month of the period observed would secure only a small fraction of the true vocabulary.

Experiment has been added to observation, and means have been taken to test the vocabulary. For example: If an object is shown to the child and she gives its name, that word is added to the vocabulary.

Of the words in the vocabulary, a large proportion are in frequent use, as shown by the repetitions recorded; some have been used only occasionally; while some have possibly dropped out of the vocabulary, though this would be difficult to ascertain.

Various classifications of the steps in speech development have been proposed (2:484). The babbling period occupies the first few months, usually at least six, and often more. This period has been carefully studied by observers of many nationalities (14:328). The order of appearance of the various sounds depends somewhat on the language. The babbling period is not considered here, as these observations commenced with the beginning of articulate speech. (2:485).

Without the use of shorthand, which was not available, it would be impossible to secure anything like a complete record when the child would talk rapidly for some time, as she often did. From fifteen to thirty minutes a day were frequently devoted to making the records, though on many days, for various reasons, it was impossible to make any record.

PART I.

Chronological Record.

There follows a record by months of some observations which seemed of interest as they were recorded (39:122). All quotations consist of words, phrases or sentences used by G.

MARCH, 1903; NINTH MONTH.

Many sounds and combinations were uttered this month. Of these, some doubtless were attempts to use words, but only two were recorded as words, "ha"=hark; "tid"=kid. These were so frequently and appropriately used that they seemed unquestionable. A young child does not talk, not only because it has undeveloped speech organs, but because it has no ideas to express (83:111). As ideas are acquired, some means of expression are simultaneously develcped.

APRIL, 1903; TENTH MONTH

During this month, if not before, sounds very like "mamma" and "papa" were made (10:460), (3:15). Other words recorded are "meow", "wow-wow" = bow-wow, "day-day" and "aya", both of the last two forms used in salutation or farewell.

JUNE, 1903; TWELFTH MONTH.

The first distinctly well articulated word positively recognized was "pretty." It was used constantly during this month and probably before. The meaning is uncertain. In some cases it seems to be an adjective, in others, merely an expletive.

SPEECH DEVELOPMENT.

Tracy (83:114) considers the second six months a period of marked advance in vocalization, though the actual articulate vocabulary is usually small. G. is not so precocious as some other children observed at this time.

JULY, 1903; THIRTEENTH MONTH.

Seventeen new words are recorded: Those which seem to be nouns are, "boo" = shoe, "lemne" = lemon, "toe," "car," "bee" = bread; exclamations are, "boo," used to frighten some one, "ah," "choo-choo," "atie," meaning unknown, "all gone," "a duie" = all dirty, rudimentary sentences; adverbs, "up," "now," "no;" verbs, "wock" = rock, "tee" = peep.

AUGUST, 1903; FOURTEENTH MONTH.

In these early months it is impossible to classify all words used into definite parts of speech. Some words, as kitty, book, etc., are certainly nouns; home may be a noun or an adverb, probably the latter; burn burn may be the thing that burns or the act of burning, and is certainly used in both ways; pad is either the act of clapping the hands together, or the hands themselves. The words are roots, capable of a variety of meanings. Yet it is necessary to make some classification in doubtful cases, while in a few, which are unmistakable, the same root is counted in each class.

The nouns are: "kitty", "cracker", "tata", (potato); "mia", (milk); "dawe", (dolly); "piece", "men", "mi", (pin); "co", (coal); "bock", (block); "eye", "book", "fiag", (flag); "bopple", (bottle); "Neenie", (Jeannie). The verbs are "diddle", (tickle); "burn burn", "pad", "wash", "close". The adverbs are "down", "back", "home". The exclamations are "ow", "please", "wee wee", "aboo."

DECEMBER, 1903; EIGHTEENTH MONTH

A gap occurs here in the records, lasting three months. During this time G. was learning to talk very rapidly, and some of the

words credited to the next few months no doubt were used during this time. Not only does the number of words increase, but the enunciation and the precision with which they are used are noticeably improved.

In December are recorded the first successful attempts to form sentences, as, "Papa go 'cool," (school); "Rain, go 'way"; "Doggie cryin' "; (imitating the whine of a dog); "Chickie says 'peep peep' "; "arm cut cut"; "Pretty no" (snow); "Burn burn" (hurt).

Buckman (6:800) says that the dropping of initial s before a consonant, as "no" for "snow", is very common in Teutaryan languages.

Forty-one new words are credited to December. Some peculiarities are "bap" = cap; "num" = thumb; "mama" = grandma; "tock" = clock; "nannie" = candy. Other mispronunciations no doubt occurred, but were not recorded.

A rather interesting incident occurred this month in connection with snow. When the first snow of the winter fell, G. admired it very much, so some was brought in the house on a plate. She would not touch the snow, however, and when urged to do so, she put her hands behind her back and said "burn burn".

This month completes the third six months, a period of marked progress, though the vocabulary is still limited and the pronunciation imperfect (83:116).

JANUARY, 1904; NINETEENTH MONTH.

Some peculiarities of this month are " 'ats the way"; "tooti" (shoofly); "Goo eyes" (goo goo eyes); "daie" instead of "dawe" for dolly.

FEBRUARY, 1904; TWENTIETH MONTH.

G. brought two dolls to a chair and said repeatedly "two dolly". She would point to each of three little girls in a picture as someone said "one, two, three", but she would not say the words.

SPEECH DEVELOPMENT.

Before this month every woman was called mamma, now one is called "ladly" (lady). Moore says that the fact that a child calls every woman mamma, or every man papa, does not indicate that the parents are not distinguished from other adults (48:122).

Sentences are frequently used. These are usually short and imperfect, as, "Hark! Boy!", "My! oh me!"

MARCH, 1904; TWENTY-FIRST MONTH.

This month was spent away from home visiting at her grandmother's where G. had many more children to play with than at home. She added 197 words to her vocabulary, making a total of 359 used so far.

APRIL, 1904; TWENTY-SECOND MONTH.

Imitation is now a strong factor in G. She wants to do everything that everyone else does, and repeats almost anything she hears. (83:117). She can use sentences of medium length. She added 118 words to her vocabulary, which now totals 477 words.

Once when G's. aunt cried, G. called her a cry-baby.

MAY, 1904; TWENTY-THIRD MONTH.

Ninety words were added this month to the total, which is now 567.

JUNE, 1094; TWENTY-FOURTH MONTH.

Tracy says that the progress is so rapid during the fourth period of six months that any detailed account is very difficult (83:118). G. certainly made considerable progress this month as well as during the whole period, but other matters prevented making very full records.

G. called lemonade "very sour." Her idea of plurality is well developed. She uses subjunctives frequently in such sentences as, "Kitty might bite." She used the expression "wind it" in connection with anything that turned, as a clock, a watch, an egg-beater, a meat-chopper. Things are named from their acts, as, a ribbon was called "a blowin' thing". She recognizes the postman by his ring at the doorbell.

JULY, 1904; TWENTY-FIFTH MONTH.

Sixty-five new words were added this month. The record was not very complete, or probably more would have been secured.

AUGUST, 1904; TWENTY-SIXTH MONTH.
(*To October Inclusive*).

No records were kept, but considerable progress was made, as indicated by the large number of words added during the next few months.

NOVEMBER, 1904; TWENTY-NINTH MONTH.

More new words (426) were recorded this month than in any other month in which a record was kept, but they were probably an accumulation of several unrecorded months. Then as this subject was decided on for a thesis this month, more time was given to the records than before.

Progress does not seem uniform. When G. associates with persons outside the family, especially children, she talks more. But an examination of the curve of total words seems to indicate that the new words in any month are nearly proportional to the total number of words, new and old, recorded in that month. This is especially true in the last three years.

G. has been asked often to name objects, so she frequently on seeing some object will say "I'll tell papa what that is."

Not all words are equally well understood or are used with

equal frequency. Variations are similar to those of adults. A few of all the words used form the bulk of the vocabulary, if measured by frequency of use.

The errors in enunciation are of interest. Some of these noted are due, no doubt, to inability to articulate perfectly, but others are due to a spirit of mischief, of perversity, or to imitation of other children. Parents, who use or encourage much baby talk, may help very materially to bring about retardation of speech development. (8:139).

The errors which follow are numbered for convenience in referring to them.

1. th, used for ch; as "theese" = cheese.
   "thunk" = chunk
2. l, used for ch; as "locolate" = chocolate.
3. ts, used for ch; as "tsair" = chair.
4. f, used for th; as "wif" = with.
   "toof" = tooth.
   "fumb" = thumb.
   "Lufer" = Luther.
5. d, used for th; as "dat" = that.
6. dh, used for j; as "dhar" = jar.

6a. n, used for j; as "nam" = jam.

7. s initial is often, but not always, omitted before another consonant, as,
   "tomach" = stomach
   "mart" = smart.
   "no" = snow.
8. l, used for r; as "player" = prayer.
9. b, used for m; as "bachine" = machine.
10. c, used for h; as "corn" = horn.
11. b, used for br; as "libary" = library.
12. gw, used for dr; as "gwink" = drink.
13. g, used for gr; as "gape nut" = grape nut.
14. "ur" = other; "nur" = another.
15. "bieach" = bread; "pemperunt" = peppermint.

It will be noted that, while certain sounds or combinations cannot be, at least are not, made in some words, they are made perfectly in other words, and further, are substituted in other words for the correct sounds, as in No. 5 and No. 6. Probably incorrect enunciations are often survivals from an earlier period when they really could not be correctly made; often they are due to laziness or habit, and perhaps to sheer perversity or a desire to show off, or to imitate some other child. G. would often, when prompted, give the correct word or sound, but when left to herself, relapse into the incorrect form. There is a period in the development of speech when a child really cannot make a certain sound. I tried long but vainly to teach a four year old kindergarten child to make the "th" sound in "the", etc., (85:17.) I showed her how to place her tongue to make the sound but without success. (51:45). I have had similar experiences with older pupils. It seems that the longer a person delays learning a sound the harder it is to learn to use it naturally; an adult German rarely learns to use the th and dh sounds correctly.

Tracy (83:118) says that the mastery of pronouns is one of the greatest difficulties a child has to overcome; that frequently the thirteenth month is reached before this is accomplished. G. is now making a good beginning and often corrects mistakes voluntarily, as, "He's sick in her froat" was at once changed to "his froat". A sentence was begun "your finger", but at once changed to correct form "my finger". Persons and genders are often sadly mixed, although great pains have been taken to teach them, as, "Mamma rockabye you" (me) is frequently used. There seems less difficulty with cases than with persons and genders. I and me are often correctly used; as, "they fit on me." Who and what are not yet differentiated; as "Who's his name?" for what's his name? Moore (48:129) says that her child began about the twentieth month to distinguish between I and you, mine and yours, and to use them in the twenty-second month, and that genders were not confused.

Verbs also are a stumbling block to the child. The imperative is now and has been for a long time correctly used; "Get me a knife." "Leave the door open."

Singular and plural are not always distinguished; "Come in here where G. are (is)."

Tenses are a difficulty, especially in the case of the irregular forms which comprise our commonest verbs.

"How are you been?" "brang, bringed" = brought.

"teared = torn, "hidded = hidden.

"must have tooken" (taken).

Up to this time past tenses of irregular verbs have been classed as separate words, but after the thirtieth month they are no longer counted separately. Present participles have not been counted as separate words.

Compound nouns (3:26) as washrag, washboard, etc., have been considered as separate words.

Wundt believes that all stories of words invented by children are fables. (14:339). Although G. has not used many words which she has invented, there are certainly a few such, as, "nix", for sewer or drain, "aya", evidently meaning goodbye, "nakyu" (thank you) said when receiving something, but more often when giving a thing to someone, "my glasses" (molasses), obstinately used, though we tried hard to induce her to use the correct word. I told her to say mo. She replied, "I can't say 'mo', I'm too little to say 'mo'."

Words are invented as names of objects by compounding simpler words, as, "blowin' thing" for bicycle pump, "cut grasser" for sickle. Other inventions will be noticed as they occur.

Contradictions are used, especially of a verb with its subject.

G. cannot count more than two.

Usually a question must be repeated, often several times before G. attempts to reply, and then answers are given slowly, after much hesitation and deliberation if there is any indecision, or if there is a spirit of perversity.

Some sentences recorded this month follow: "Uncle Paul hurt his arm; he had to bind it up." "Don't that beat the Dickens?" was remarked when G. could not open a drawer. "My! but that's an ugly old picker!" was said when she could not loosen a burdock burr from her coat.

An excellent illustration of enduring memory occurs this month. The song "Kentucky Babe" was sung once to G. The expression "boogie man" was remembered and used by G. in various ways, as, "Boogin down there." (In the cellar, or in a hole in the yard).

DECEMBER, 1904; THIRTIETH MONTH.

Sounds, especially of the consonants, still give trouble (48:117). "Des" and "deres" (there's), "fred" (thread), "wif" and "wiv" (with), "haf" (have), "at" and "dat" (that), "dis" (this), etc., but they can all be corrected pronounced as "thing", "there".

W is used for r, as, "wusty" (rusty); b = t, as, "bobble" (bottle); d = g, as, "redister" (register); "tumler" (tumbler); "hollow berry" (holly berry); "shubel" (shovel); "gakoo" (cracker); "aproncot" (apricot); "puggin" (pumpkin).

Contractions are frequently used, "I'll" = I will; 'doesn't" = does not. Irregular plurals are formed, as, "feeties" and "footies" = feet.

The persons of personal pronouns are usually, but not invariably, correct, as, "We'll shave herself", (ourselves). Can't hurt herself," (her), but "I'm shaving myself", instead of herself, as formerly. (83:118.)

Usually a is used before consonants and an before vowels. Final g of ing is often elided, but can be sounded, especially in words of one syllable.

The difficulties of enunciating sounds correctly are being gradually mastered, but the mastery of the forms of the irregular

verbs is still very difficult. "Isn't" = are not; "I has" = I have; "it's all wind" = all wound; "drawed" = drew; "wanter" = want to.

Conjunctions and prepositions are not always distinguished, as, "There's a horsey of wagons", instead of "and wagon". Diminutives and diminutive endings are much used and enjoyed, as, "toey", (little toe); "warmy", (warm); "pinnies", (pins). We notice that not only nouns, but other parts of speech, as adjectives, may receive diminutive endings.

We cannot be sure that a word has been dropped from the vocabulary, because we no longer find it used. A word may remain dormant or potential for months, perhaps years, and then be used when required. As an example, the word hoptoad was used last summer and apparently lost from disuse. Recently, months later, when toads had long since disappeared, a peach stone was called a hoptoad.

JANUARY, 1905; THIRTY-FIRST MONTH.

There seems to be some improvement in the use of pronouns. "What's my name?" in response to "What's your name?", shows discrimination of personal pronouns. First and second persons are usually well distinguished, although sex is not, as shown by the use of herself for himself. "Girl got mark on its nose." "Those vocabulary." "Why (what) did you do that for?"

Love for rhyming and alliterative expressions is shown by frequent use of such inventions as, "doggie, poggie, woggie", "spooly, booly, wooly", "dolly, polly, wolly", "bunny, wunny", "piggie, wiggie". (83:114); (10:470).

Verbs are causing many errors, as, "I hasn't", "I doesn't", "I want see" (to see). Final g of ing in participles is usually omitted, as, "comin' ".

All the sounds represented by the letters of the alphabet can be correctly made in imitation of some one who pronounces them.

In some positions, especially initial, r is not uniformly well pronounced, "wich" is used for rich, but the correct sound can be made.

The correct sound of wh initial is not usually given, "wen", (when), but on prompting G. can give the correct sound. Th, dr and squ are still difficult, "Kafryn", (Katharine), "dwars" (drawers), "gueezin' " (squeezing), "googer", (sugar).

G. now realizes that she is the subject of observation and experiment. This feeling of self-consciousness grows stronger continually and tends to interfere at times with the recording of her vocabulary. She often takes a pencil and paper and says, "I must write in my vocabulary." This word is often pronounced correctly, and also, "cabulary" and "becabulary."

The word elbow can be correctly pronounced, but is usually called "ayabo." "My finger is all sored," is an illustration of the construction of a word by analogy with perfect participles. "Bessons" is an unknown word used frequently, as, "bessons and things in it." The word is undoubtedly an invention. We have tried hard, but in vain, to discover a meaning for it. Some of the words G. has invented have a very definite meaning.

FEBRUARY, 1905; THIRTY-SECOND MONTH.

Persons in pronouns are now usually well discriminated. Regular comparison is used in the case of such adjectives as "beautifuller." The adverbs are not always distinguished from adjectives, as, "possible" was used as an adverb.

MARCH, 1905; THIRTY-THIRD MONTH.

Th is still troublesome; "ding" = thing. Contracted forms, as, "isn't," "don't," "here's," are much used. These forms appear to follow, in point of time, the full forms.

Verb forms cause trouble. "I wants," "writed" (wrote), "telled" (told), "She have (will have) to light a lamp." Some auxiliary forms are correctly used, as, "She ought not to get fat."

APRIL, 1905; THIRTY-FOURTH MONTH.

Yes is used rather frequently now, but not often before this month. It appears much later than no. The infinitive mode is often correctly used.

"Steicher" is an invented word. It means cobweb and, apparently, nothing else. Frogs (in a picture book) are called "robbers." We do not know where or how G. learned the word robbers, nor what made her use it for frogs, which she does persistently.

Self-consciousness is frequently shown when records of G's. vocabulary are made, by such remarks as, "You're writing in my vocabulary."

In recording words we find much repetition at the same or different times (68:134). A word or topic is taken as a theme and endlessly and tirelessly repeated in the same form or with variations.

G. is becoming less satisfied with pretending and desires real, or at least objective, things in her play, as, a bucket, soap and washboard for washing.

The persons and cases of pronouns are usually correct, few mistakes being made, but "these sort" and similar errors, which she does not hear at home, show that number is not fully mastered.

Comparatives and superlatives of adjectives are freely and correctly used.

The regular formation of plurals is now grasped, as shown in its application by analogy to such words as, "mans" for men.

Mispronunciations are due not so often to inability to enunciate certain sounds, as to inability to keep these arranged in correct order, as, "pertend=pretend; "berember"=remember; elision of some part of the word occurs, as in "monian"=ammonia; or occasionally such additions as in "tydphoid"=typhoid, occur, due possibly to rhyming of the first syllable with the second.

MAY, 1905; THIRTY-FIFTH MONTH.

Many compound words are formed. These are often original with G. Such inventions, just as errors, show analogy and reasoning power, as also do regular forms used for past tenses of irregular verbs, as, "taked"=took. "I were"=I was, is due to confusion of numbers.

G's. enunciation has been good, so good in her thirtieth month as to cause considerable comment, but recently there has begun a tendency to drawl, making two syllables out of one, as, "ye-us" = yes. This word yes is now used more and more in answers instead of repeating the whole question, as was formerly done.

Frequently a thing said by some one else is repeated by G. with proper grammatical changes, as though the person that G. addresses could not hear or understand without this interpretation, as, "I am going upstairs", becomes, "She said, 'she is going upstairs.' "

JUNE, 1905; THIRTY-SIXTH MONTH.

Sometimes when G. makes a mistake, if she is instructed just how to place her vocal organs, the difficulty will disappear. In the case of children having more serious impediment, this method has not succeeded. With regard to some sounds, laziness rather than inability, seems to cause an easier sound to be given in place of a harder. Hall says (29:133), "Old baby forms often persist from habit long after the correct form can be uttered." Some errors are "frough" = through; "inspensive" = expensive; "crocrets" = croquets; "breakfuts" = breakfast. The word little is now pronounced "ul." Occasionally, when corrected, G. will give the proper form, but often she will obstinately repeat the error. This growing obstinacy is becoming a retarding factor, causing, at least, a temporary retardation in speech development.

Other errors are, "You and me wouldn't"; "goed" = went; "were I" = was I (frequently used); "must leave" = must let. The words leave and let are badly mixed in spite of corrections.

The word yes is seldom used now. Its place is taken by the grunting sounds represented by "uh uh". Mistakes in forming plurals are shown in "womans" = women, and in a peculiar pluralizing of the adverb in "they got their hat ons" = hats on. The word "bropre", of unknown meaning, was evidently invented, and is often used.

G. is becoming fond of rhyme and meter. She sang "On a summer day she ran away", which she made up herself.

JULY, 1905; THIRTY-SEVENTH MONTH.

Mistakes this month are: "vocay" = bouquet; "besturb" = disturb; "berember" = remember; "wiv" = with; "abel bie" = apple pie; "lugy vorce" = lucky force; "wader" = water; "billow" = pillow; "pimble" and "bimble" = pimple; mutes are frequently thus vocalized, apparently for the pleasure of the effort. "Buthy" = bunny. In this case the sound "th" can be given and seems to be preferred to the correct sound. In such words as Katherine th is usually changed to f. "Cabus" is used for vocabulary.

Vowels have been sounded very accurately, as a rule, but lately there has been a tendency to corrupt the vowels as well as the consonants, as, "boicy," "moizey," "mizey" = micey; "pensoil" = pencil; "mommo" = mamma. Vowels seem at first to give less difficulty than some consonants.

The changes in vowels in the past tense of irregular verbs are not usually to be accounted as corruptions, though they may be in certain cases. They are usually the result of an effort to form these tenses by analogy to other forms already known, or perhaps to pure guesswork when the correct form is unknown or not remembered.

Attempts to prevent these and other corruptions, as, "ul" for little, "uh-uh" for yes, and abbreviations, as, "po" for potato, "high" for high chair, seem without effect.

When G. is angry she indulges in an almost inarticulate jargon of sounds. This has been noticed since the thirty-fourth month.

Pennsylvania Dutch expressions, as, "I want up," "I want down (or out)," have been learned from companions when visiting, and, in spite of frequent corrections, are much used.

Certain words, as, "Cornell," will be repeated over and over again, it seems hundreds of times, apparently for the enjoyment of the sound or of the muscular coordinations.

A story was invented by G. One version is, "Once there was a little bunny and a big wolf ran after him and the bunny ran like everything, and ran in his hole, and I whipped the big wolf." This was frequently repeated in varying forms, usually less complete than the one given.

It is noticed that in learning abstractions and relational words, the word must come first in use: the meaning seems to follow use. Miss Sullivan remarks this observation about Helen Kellar, in the latter's autobiography.

AUGUST, 1905; THIRTY-EIGHTH MONTH.

The unit of thought seems to be the sentence, which is correctly used, even when some of the component words are certainly not understood. Such sentences may be remembered entire or in part from the speech of other persons. Many words are commonly used long before they can, from their very nature, be understood, as, "God," "Jesus," "Spirit."

The great desire of the child is to have things named, to know what things are. This habit seems to be carried all through early childhood, at least. The child is not prevented from asking questions by the fear of seeming ignorant, as many adults, and even high school students are. The child seems satisfied with a name, even if it is not full of meaning. Almost any word, no matter whether long or short, at this period, can be remembered as the name of some object, or even without special connection with anything else.

Self-consciousness is illustrated by such remarks as, "Are you writing my name?"

Mutes are vocalized frequently, as, "abel" = apple; "hair-bin" = hair-pin; "durdle" = turtle; "twingle" = twinkle; "gitty"=kitty; "pimble" and "bimble"=pimple; "Miss Muv-vid" = Miss Muffet; "bigcher" = picture; "gandy" = candy. Vowels are corrupted as previously. "Boyen" = bun, which was formerly, and can still be, correctly pronounced. Abbreviated forms of words are used.

Personal pronouns are well differentiated now in cases, persons and number; few mistakes are made.

SEPTEMBER, 1905; THIRTY-NINTH MONTH.

Errors in articulation and corruptions in vowels and consonants occur as previously.

"Is there a deep brook down there?" shows two uses of the same word in one sentence.

Incorrect past tenses of irregular verbs are: "brang" = brought; "You oughtn't to'v doin (done) that;" "I can reach from up there" shows use of a compound preposition. By the mistakes which children make we may obtain clues to their mental development. Regular forms invented for irregular verbs show that the child is constructing forms by analogy with others, really a logical process.

OCTOBER, 1905; FORTIETH MONTH.

G's. enunciation and pronunciation are much poorer than a year ago. An affected style has replaced the pure, simple, straighforward enunciation of the thirtieth month. She uses much baby talk, and quotes and imitates a baby next door, also other babies of her acquaintance, and pretends to be a baby. She abbreviates not only words but sentences, as, "silver," meaning, "I want a drink in my silver cup." This is a period of slow development, almost stagnation. In the 40th, 41st, 42nd and 43rd months, 37, 23, 54 and 12 words respectively were recorded, a

total of only 126 new words, although at least 1500 new words, old and new, were recorded.

There is still much trouble with irregular verbs.

NOVEMBER, 1905; FORTY-FIRST MONTH.

A few errors noted are: "Threwn" = thrown; "caught" = catch; "caughting" = catching; "hidded" = hidden; "weared" = worn; "portant" and "porkant" = important; "bited" = bit.

DECEMBER, 1905; AND JANUARY, 1906; FORTY-FIRST AND FORTY-SECOND MONTHS.

Such errors as those of the previous month are sometimes corrected without prompting, as, "loosed" was at once changed to "lost." The mistakes are the same as in previous months. "Tunette" = tune, was invented, perhaps, by analogy. Such an error as "bushful" for bushel, is probably due to sound resemblance and a misconception of the term. "Match a light", for strike a light, shows the tendency to employ a term as noun, verb or adjective, as occasion demands, thus extending to words in general a property which belongs to a few roots. "Weigher" = scale, shows the tendency to name an object from its use.

FEBRUARY, 1906; FORTY-FOURTH MONTH.

"I don't say brang any more; I say brought," shows that there is a growing appreciation of the difference between correct and incorrect forms. A few errors are: "Grinded" = ground; "sticked" = stuck; "knowed" = knew. Nearly all are regular forms invented by analogy.

Self consciousness increases in G. as she realizes that she is the subject of observation. This may lead to the invention of nonsense in a spirit of pure mischief, as, "Graboil, write down graboil."

SPEECH DEVELOPMENT.

MARCH AND APRIL, 1906; FORTY-FIFTH AND FORTY-SIXTH MONTHS.

Errors are similar to those of previous months. "Spended" = spent; "blowed" = blew; "tooken" = taken; "stinged" and "stang" = stung; "writed" = wrote; "bringed" = brought; "readed" =read (past); "spitted" = spit. Some of these are modelled after regular forms, a few are constructed by analogy with irregular forms. "Them primers" for those, shows mixing of personal and possessive pronouns. Such mistakes occur as a result of a greater range of ideas than the memory is supplied with correct forms to express. "Of I" = of me, shows that mistakes may still occur among personal pronouns. Double negatives occur, as, "Won't eat no more," an error which G. had probably never heard in speech.

Curiosity to know what is being recorded in the vocabulary is often shown. "Papa's writing down my words." G. got a little blank book, looked for a time intently at her doll, then said, "She said something," and at once began to scribble in the book. I'm saying that just for fun," she remarked, as someone was making a record of her conversation.

MAY, 1906; FORTY- SEVENTH MONTH.

Among errors are: "Gotting" = getting; "hoppen" = hopped; "tooken" = taken; "putten" = put (past); "dranked" and "dranken" = drunk; "blowed" = blew; "has been bite" (bitten). Vowels are drawled making two syllables of one, as "aga-un" (again); "na-ow" (now); "ye-us" (yes); "bre-ud" (bread). The tendency to baby talk before noted has continued, and even increased. Errors occur in the use of consonants. Some are due to perversity, the substitution of difficult for easy sounds, as, "buther" = butter; "rinch" = rinse.

G. corrected someone who said "I done", saying, "You shouldn't say done; you should say did." When tested by say-

ing to her, "I must shave herself," she replied, "You mustn't say shave herself; say shave myself."

JUNE, 1906; FORTY-EIGHTH MONTH.

Some errors are: "hadn't sain" (said); "undoed" = undid; "spended" = spent; "aten" = eaten; "has ate" =eaten; "sewn" = sewed. "Most cleanest" and "more badder" show double comparison. "Cut grasser" was invented for sickle. Drawlings of vowels, umlauting vowels, as, "soe"=see (frequently used) and vocalizing mutes occur often.

On Sunday, June 17, G. had a birthday party (one week early). She was told then that next Sunday would be her birthday. The subject was not mentioned again to her after Friday, June 22, but she talked about it all the week, and somehow kept track of the time, for of her own accord on Saturday she said, "Tomorrow will be my birthday," and on Sunday morning she said, "I am four years old today."

JULY, 1906; FORTY-NINTH MONTH.

The tendency to baby talk still continues, increasing rather than diminishing, also much unintelligible babbling, presumably in imitation of a baby just learning to talk. When playing alone, G. will babble by the hour, mixing in words and sentences. Examples of invented compounds are "lighter lamper," = lamp lighter; "lacerfold" = ? "Childs = children, is an example of regular plural for irregular.

AUGUST, 1906; FIFTIETH MONTH.

The errors are much the same as in previous months. "Splincter" = splinter. Such adverbs as "simply" and "absolutely" are correctly used. The sense of possession is shown by the frequent use of "my."

SPEECH DEVELOPMENT.

SEPTEMBER AND OCTOBER, 1906; FIFTY-FIRST AND FIFTY-SECOND MONTHS.

Baby talk and drawl continue, and the errors are about as in former months. "Ought not to have breaken," "I haven't maken it yet," show the construction of perfect participles by analogy to taken. "Wroted and writed" = written. "Thinked" was at once corrected to "thought."

G. entered kindergarten October 1st, 1906.

NOVEMBER AND DECEMBER, 1906; FIFTY-THIRD FIFTY-FOURTH MONTHS.

The clipping of syllables and words colloquially common among adults is noticeable even in cases where presumably G. has never heard these in conversation.

"Goodest" for best shows appreciation of comparison of adjectives. "More warmer" shows double comparison. Mistakes made by other persons are noticed and corrected, as, "Preston says brack pomy for black pony."

The names of the week are used, probably having been learned at the kindergarten.

JANUARY AND FEBRUARY, 1907; FIFTY-FIFTH AND FIFTY-SIXTH MONTHS.

Errors are much as in other months. Drawl and baby talk continue. The vocabulary is really larger than the records show, for many words are used in varying and quite different senses, either as different parts of speech, or in different meanings of the same form and part of speech.

MARCH, APRIL AND MAY, 1907; FIFTY-SEVENTH, FIFTY-EIGHTH AND FIFTY-NINTH MONTHS.

Self-consciousness grows. G. often notices or corrects the mistakes of others, as, "Jessie says 'dink (or gink) of water': G. can say 'drink of water.'" Such mistakes as, "consilitis" for

tonsilitis, and "Jack in the Popet" (Pulpit), seem to indicate inaccuracy in perceiving sounds. "Is that him?" shows that the objective case after verbs is distinguished.

JULY, 1907; SIXTY-FIRST MONTH.

Errors are "druved" = drove; "teached" = taught.

AUGUST, 1907. NO RECORDS.

SEPTEMBER, 1907; SIXTY-THIRD MONTH.

Such expressions as, "Let's look in the enlope once," are imitated from companions. Other errors are, "corter" = quarter; "crown" = crayon; "enlope" = envelope.

OCTOBER, NOVEMBER AND DECEMBER, 1907; SIXTY-FOURTH, SIXTY-FIFTH AND SIXTY-SIXTH MONTHS.

Errors are, "dag" = dig; "lie" = lay; but "lied down" was at once spontaneously corrected to "lay down."

Self-consciousness often takes the form of nonsensical combinations and a reluctance to talk for record. "Here don't you write that down." G. takes delight in endless repetitions of verses or stanzas of selections learned at school, or in nonsense.

JANUARY, FEBRUARY AND MARCH, 1908; SIXTY-SEVENTH, SIXTY-EIGHTH AND SIXTY NINTH MONTHS.

Self-consciousness increases. "Now is the time I want you to write just what I say." While records are made G. makes such remarks, or else objects to having any record made. She has the colloquial tendency to slur endings and to obscure unaccented vowels.

A pronounced tendency to stammer has appeared. This was entirely absent at the end of the thirtieth month, when enunciation was very good. Deterioration began very noticeably about the

fiftieth month when G. entered the kindergarten. It may be partly due to imitation of several kindergarten children who stammer badly, though it was observed to a degree before her entrance to the kindergarten. It may have some connection with the development of adenoids, which were removed in the eighty first month.

APRIL, MAY AND JUNE, 1908; SEVENTIETH, SEVENTY-FIRST AND SEVENTY-SECOND MONTHS.

Errors: "ariole" = oriole; "catarrh" = guitar; "ducking" = duckling; "Easer" = Easter; "lu pig"=little pig; "noceros" = rhinoceros; "I'm bown declare" = I vow and declare; "medals" = petals (probably an error in audition). G. has formed the colloquial habit of prefacing statements with 'why.' No amount of correction has served noticeably to abate this error. It is much harder to combat such a mistake, which requires negation, than one requiring a positive command. "Why are you writing in my vo? I'd better talk an awful lot."

PART II.

Analysis of Curves on Chart.

Eleven curves are traced on the chart, as follows:

1.	Total words used	3384.	
2.	Saxon words	2993.	88.74%
3.	Total nouns,	2066.	61.07%
4.	Total verbs	677.	20.01%
5.	Compound nouns	407.	12.03%
6.	Total adjectives	400.	11.82%
7.	Words of foreign derivation,	345.	10.19%
8.	Proper nouns	262.	7.74%
9.	Mispronounced words	141.	4.16%
10.	Total adverbs	132.	3.90%
11.	Invented words	45.	1.33%

The curves for interjections, prepositions and pronouns, if plotted, would almost coincide with that of invented words, so they are omitted because they would confuse the chart.

Each horizontal line on the chart represents 100 words. At the right of the chart are the numbers of the curves; at the bottom are the numbers of the months. Each oblong space represents one month horizontally, and vertically one hundred words.

The curve of compound words crosses that of adjectives in the seventy-first month: the curve of foreign words crosses that of proper nouns in the forty-ninth month. To save confusion curves 5 to 11 inclusive begin with the twenty-ninth month.

It will be noticed how closely the curves for total words and Saxon words run together throughout the entire period, and what a large proportion nouns form of the whole vocabulary in all

months, particularly the earliest. Nouns, verbs and adjectives compose nearly 93%, (48:130). Proper nouns form a relatively small percentage, 7.74%. These are the most likely of all words to drop out with a change of environment, and yet even these words, it was observed, were retained with remarkable persistence, often for more than a year after all apparent occasion for their use has disappeared.

Four breaks occur in the records. There is one from the tenth to twelfth month, when there may have been no new words used, if, indeed, any of the vocalizations of these months may properly be termed words. Also two important breaks occur, from the fourteenth to the eighteenth and from the twenty-fifth to the twenty-ninth months, doubtless causing a loss of some, perhaps many, words, which were probably used, but not recorded until later. A brief gap occurs for one month only, after the sixty-first month.

The numbers in the table for total words used represent, approximately, the number of words recorded in each month, including, of course, many repetitions. No estimate is given before the eighteenth month because the material gathered was not preserved after the new words had been recorded. Probably from 40,000 to 50,000 words were collected in the records.

It is noticeable, especially in the early months, that wherever the records for a month were small, the curve shows a drop which nearly corresponds. One might suppose that a great increase in the number of words recorded in any month would give a corresponding increase in the number of new words for that month. This is true only to a limited extent. The greatest increase noted occurs in the twenty-ninth month, after a gap of three months without any record. While 426 new words were recorded, some of these probably belong in reality to previous months. In the seventy-second month the greatest number (1950) of words for any one month was collected, but in all this material there were only 85 new words. The experiment shows that, while there is an increase in the number of words used, there is a sameness to the

vocabulary, a constant repetition of the words already learned. Possibly we may conclude that the vocabulary development is a fairly steady operation, and that a perfect record of all the words used by a child would cause a curve which would be nearly a straight line. The exceptions would occur when a change of environment brought a new vocabulary into the experience of the child. G. made quite a few visits and trips, two removals to other cities and also, in the fifty-first month entered the kindergarten and in the seventieth month the primary school. The influence of these changes is noticeable to parents, but does not materially affect the steepness of the curve.

Invented words play an important part in the development of some children (8:136), perhaps oftener when children of the same age play together, but they form a very small part of G's. vocabulary.

The mispronounced words form 4.16% of the total vocabulary. Probably more complete records in the first twenty-four months would have increased this percentage considerably. Most of these mispronounced words were recorded in their correct forms and counted again in the months when so recorded. About the thirtieth month the enunciation was remarkably clear and correct, more so than that of many adults. Later, a degeneration in this respect was noticed. The precise cause of this is not known. Some of it was doubtless caused by association with younger children and imitation of errors: some seems due to obstinacy.

The vocabulary contains 12.03% of compound nouns, compounded in the Saxon way. Some of these are in regular use, as, ash-pan, ash-pile, sewing room; others are unique inventions, as, "cut-grasser", for sickle, "hop-grasser", for grass-hopper, "board-wash," for wash-board, etc. Some of these occur in the compound form only, but many appear also in the simple form or in several combinations. The compound form usually preceeds the simple form, as, "bath-tub," in the twenty-first month, "bath-room," in the twenty-ninth month, "bath-robe," in the thirtieth month, "bath," in the thirty-third month.

Words derived from Latin and other foreign languages play but a small part in the vocabulary, 10.19%. Just why this should be so is not clear, as G. heard such words constantly and in abundance. Perhaps a child retains in memory and uses only such words as are related to its experiences and are intelligible in a concrete way. This is certainly true in a general way, but many puzzling exceptions have been noticed.

Plurals of nouns are not separately recorded, but are considered the same form as singulars. Diminutives, such as "toastie," for toast, are not recorded as separate words when the correct form occurs at the same time. Past tenses and perfect participles of irregular verbs are recorded separately until the thirtieth month. These total fifty words of the vocabulary. Past tenses of regular verbs and all present participles are considered the same as present tenses and are not separately counted. Where a word of the same sound or form is used in two or more senses, as, ride, the verb, and ride, the noun; cold, adjective and noun, it is recorded as a separate word for each use.

Irregular plurals of pronouns are counted as distinct words. Seven such are recorded. In the case of the articles a and an, each is counted a separate word. Comparatives and superlatives of adjectives and adverbs have been considered the same forms and not separately counted. Compound prepositions and expressions used as such are not counted separately, but only in the component words.

PART III.

Sounds

VOWELS.

In the babbling period vowel sounds precede the consonants, because the latter require more or less adjustment of the vocal organs. Chamberlain (10:126) remarks that some writers on the speech of early childhood have not only recognized a pure vowel period, but have distinguished closely the times of appearance of the individual vowels, and it seems to be generally admitted that vowels precede consonants. All the ordinary vowel sounds are made freely by the time the record begins in the ninth month, and usually made correctly. The mistakes which appear later seem to be due to misapplication of principles, as in forming past tenses of verbs according to false analogy; to hearing sounds incompletely or incorrectly; to laziness or perversity, rather than to inability to make those sounds (13:51). This seems to be proved by the fact that the sounds which are incorrectly given in some words, are correctly made in others (14:329.)

The single numbers refer to months in which a record is made.

9. a (arm). 10. a (hat). 12. e (beet), e (her), u (hurt). 13. a (all), e (pet), oo (food), o (gone), u (but). 14. i (pin). 18. oo (foot). 21. a (basket).

DIPHTHONGS, (8:127)

10. ay (as in day), ow (as in how). 13. o (as in toe). 21. oy (as in boy), i (as in bite). 29. ew (as in few.)

Some errors are given in the chronological records (3:42). A few are: 29. "tookin'" = taken; "ur" = other. 30. "ah" = I; "holloberry" = hollyberry; "wanter" = want to. 34.

"pertend" = pretend (63:92). 35. Recently a drawl has been assumed. This corrupts the vowels (6:800). This drawl is the beginning of a serious decay in the use of vowels (31:597), which continues to the end of the records, though strenuous efforts were made to overcome this defect. Sounds which were made correctly are made so no longer, at least in certain words, while they may be correctly vocalized in others.

STAMMERING AND DETERIORATION.

37. About this time a tendency to stammer appears. This tendency increases up to the end of the sixth year, and, indeed, beyond this time (51:45). Such changes in vowels as "mommoh" = mamma; "pensoil" = pencil are frequent. An affected style of speaking is springing up, due, apparently, to perversity, rather than to inability to vocalize correctly (85:17). This leads to corruption of both vowels and consonants, as, "boicy, moicey, moicey, and mizey" are all used for micey. Along with this vowel decay goes a tendency to vocalize many unvoiced mutes, as, "abble" = apple; "buthy" = bunny; all which sounds can be given correctly. 45. "Aboil" = apple. 46. "Bonan" = banana. 47. "Aga-un" = again; "na-ow" = now. These words are drawled so as to change the vowel and make two syllables of one. Frequently a vowel is given a sound like the umlauted vowels in German, "soe" = see.

51. G. now enters Kindergarten, where there are several children who stammer or have other speech defects, as inability to articulate certain sounds. These errors of speech are imitiated by G. whose stammer now increases considerably. 55. "Purty" = pretty. 56. "Dreuve" = drove. Drawl increases. 72. "Ariole" = oriole. At the present time most of these defects have passed away (112th month), and reappear chiefly when G. associates with a baby or a child who does not talk well.

CONSONANTS.

The mutes (14:330) seem easiest of the consonants to learn (24:18). At first the unvoiced mutes, t, d, p, seem easiest, but as the voiced mutes and other voiced consonants are learned, they seem to be preferred in place of easier sounds, (60:8), perhaps for the pleasure of making the sounds. Imperfect articulation may be related to imperfect function of the auditory nerve (13:51).

The consonant sounds were recorded for the first time in the following months: 9. k, h, (14:345). 10. p, m, d, (11:107). 12. t. 13. b, l, w, (initial), ch, g, (hard), n, r, (6:804), 14. s, z, sh, f. 18. th (thin). 19. v. 20. j (dzh.). 21. th (then). 30. y (initial). 70. j (zh).

Compound consonants were recorded in order as follows: 12. pr. 13. dr. 14. pl, cr. 19. gl. 20. st. 21. bl, br, gr, hw, str, sk, sl, sp, ng (final). 22. fl. 23. sn. 24. tr. 25. spl. 29. fr. 30. tw, sm. 34. kw (qu). 55. spr. 60. shr. It is probable that some of these sounds occurred before they were recorded on the words from which they have been taken.

Errors noted are: 14. g = sh, "googer" = sugar. 18. n = th, "num" = thumb; p = t, "bopple" = bottle; b = k; "bap" = cap; "nannie" = candy; "too ti" = shoo fly.

29. "Th" = ch; "theese" = cheese; l = ch, "locolate" = chocolate; l = r, "player" = prayer; b = br, "libary" = library; f = th, "fumb", "toof", "Kafrin," and many other; ts = ch, "tsair" = chair; t = st, "tomach" = stomach; d = th, "dat" = that, "deres" and "des" = there's; gw = dr, "gwink" = drink; b = m, "bachine" = machine; c = h, "corn" = horn; m = sm, "mart" = smart; n = sn; "no" = snow. Initial s before another consonant is usually, but not always elided. 30. B = v, "shubel" = shovel; f = v, "haf" = have; dw = dr, "dwarseys" = drawers; d = g, "redister" = register; w = r, "wusty" = rusty; g = mpk, "puggin" = pumpkin; b = bl. "tumler" = tumbler; there and thing can be and often are correctly pronounced, but not

usually, "at" = that. Other mistakes are: "sumpn" = something; "aproncot" = apricot; "I'll" = I will. 31. Gu = squ, "gueezin'" = squeezing; "funder" = thunder; "sored" = sore; "ladly" = lady; "ayabo" = elbow. 32. "Ding" = thing. 34. "Tydpoid" = typhoid; "pertend" = pretend. 35. B = v, "inbisible" = invisible; v = b, "vocay" = bouquet.

36. "crocrets" = croquettes; "breakfuts" = breakfast; "inspensive" = expensive; "frough" = through. 37. th = n, "buthy" = bunny; v = th, "wiv" = with; b = p, "abble" = apple; "bie" = pie; "billow" = pillow; g = k, "lugy" = lucky; v = f, "vorce = force; d = t, "wader"=water; "pimple" "pimble" and "bimble" are used interchangeably. This is pure perversity, as the correct sounds can be made. 38. G = k, "twingle" = twinkle; "gandy" = candy; d =t, "turdle" = turtle; "muvvid" = muffet; b = p, "hair bin" = hair pin;"bigher" = picture; "frough" = through; frow" = throw. "Moicey," "micey," "moizey," "mizey" and "boicey" are all used interchangeably. Special delight is taken in voicing the unvoiced mutes. Pure perversity seems the only explanation of many of these errors, as G. frequently refuses to give the correct forms when admonished, but at other times corrects the mistakes. "Another" and "filthy" can be correctly sounded. 39. G is added where it does not belong, as, "muvving" = muffin. 45. "Aboil" = apple; "gizzy" = dizzy; "shubel" = shovel. 46. "Ecept" = except; "quuller" = cruller. 47. "Buther" = butter; "rinch" = rinse; "porkant" = important; "besept" = except. 48. "Purtend" = pretend; "ged" = get. 49. "Besturb" = disturb. 52. "Purty" = pretty. 53. "Gum" = come. 54. "Gwink of wather" = drink of water. 55. "Besept" and "except" both are used. 57. "Dink", "gink" and "drink" are all used.

(58) "Popet" = pulpit. (59) "Consilitis" = tonsilitis. (61) "Corter" = quarter. (70) "Lue pig" = little pig; in this case the umlauted sound is made. "Ul" also is used for little. "Easer" and Easter" are both used, also "boomies" and

"bloomers." (72) "Clob-hopper" = clod-hopper; "medals" = pedals. No amount of persuasion, suggestion, coaxing or command seems to have any effect on these mispronunciations. A difficult form, like "ayabo" (31), seems preferred to the easier elbow. Many similar instances occur.

From the 30th month there is a growing tendency to employ repetitions, as, "lammie, lammie," alliterations, as, "dumb deezer" for dumb geezer, rhyming expressions, as, "doggie, poggie, woggie," and to use baby talk and a pronounced drawl. When G. is angry she employs a jargon of almost inarticulate sounds. Often when playing by herself, she will babble by the hour, mixing in occasionally some articulate words and sentences. This babbling decreased when she had not seen a baby for a long time. She takes delight in endless repetitions of verses, stanzas or nonsense. Adenoids, which were removed in the 81st month, may have had some effect on her speech, as they certainly did on her hearing.

NOUNS

In earliest speech the parts of speech are not differentiated. The same word or root seems to be used in more than one sense. With the evolution of the grammatically correct sentence this confusion tends to disappear, though many words retain the force of noun, adjective, adverb or verb at different times. The earliest nouns recognizable as such usually have the diminutive ie, as, doggie. 20. The earliest noticed counting of objects was "two dolly", repeated several times. G. would point to objects as these were counted by some one else. 22. Visits made by G. introduce new words, especially proper nouns. 29. Association with young children stimulates to conversation and increase of vocabulary. G. is often asked to tell the names of objects, so she often says voluntarily, "I'll tell papa what that is." She calls a bicycle pump a "blowin' thing." 31. to 34. She delights in

repetitions, as, "doggie, poggie, woggie;" "dolly, polly, wolly;" "spooly, booly, wooly;" "bunny, wunny." Such expressions seem to be used for the enjoyment of the sound. A word or topic will be taken as a theme and will be repeated endlessly and tirelessly in the same form or with variations. The regular plural is now grasped, as shown by its use in the case of irregular nouns; "There were two mans tacking." Also shown (36) by pluralizing the adverb instead of the noun, as, "They got their hat ons," for hats on. 37. "Womans" = women. 49. "childs" = children; 64. reindeers.

Many abbreviated forms are used (37) probably less from laziness than perversity, as, "straw" = strawberry; "vin" = vinegar; "po" = potato; "rasp" = raspberry; "little Red" = little Red-ridinghood; "high" = high-chair, etc. This common habit continues for months. 40. G. is inclined also to abbreviate sentences.

38. Her great desire is to have names for objects. 48. If names are not known compound nouns are often invented to supply the need, as, "cut-grasser" = sickle; 49. "light-lamper" = lamplighter. 54. G. now uses the names of the days of the week.

VERBS

Verbs are a great stumbling block to the child. Tenses are often mixed, particularly in the irregular verbs, as, "How are you been?" This appears to be one of the child's greatest difficulties in learning to talk. A regular form is learned, only to find that in the most commonly used verbs it is not employed. Then, having mastered the irregular principal parts of a verb, the child finds that these do not fit regular or still other irregular verbs. Hence endless confusion results for months and even years, until imitation and habit have fixed the correct forms into automatic acts. The changes in verb endings are another, though a smaller diffi-

culty. "I knows," by analogy, from he knows. At first irregular verbs are given regular forms; later, irregular forms are constructed by analogy with other irregular verbs already learned. By the mistakes children make in words and sentences, we may often obtain clues to the progress of their mental development. The child, as well as the race, tries to simplify language, to get rid of irregularities and establish a rational basis for grammar. Much of the bad grammar we hear among the uneducated is due to this tendency, notably the use of the objective case after forms of the verb be.

Some errors follow: 30. "It's all wind" (wound). 33. camin' " = coming; "writed" = wrote. 36. "Goed" = went; "must leave" = must let; "were I?" = was I? 37. "Dagged" = dug; "lied" = lay. 39. "Brang" = brought; "You oughtn't to'v doin' that." 40. "Tooking" = taking; "thinked" = thought; "lied down" = lay down; "buyed" = bought. 41. "threwn" = thrown; "caughting" = catching; "hidded" = hidden; "weared" = worn; "bited" = bit. 44. "Grinded" = ground; "knowed" = knew. 45. "Spended" = spent; "blowed" = blew; "tooken" = taken; "stanged," "stinged" = stung; "readed"=read; "spitted"=spit; "writed"=wrote; "bringed" =brought. 47. "Dranked"= drunk; "has been bite"=has been bitten. 48. "Hadn't sain" (said); "undoed" = undid; "aten" = eaten; "sewn" = sewed. 49. "Beated" = beat. 50. "Gaven" = given; "hurted" = hurt. 51. "Ought not to have breaken" (broken). 52. "I haven't maken it yet;" "wroten" = written. 53. "Bettern't I?" = Would I better not? "builded" = built; "drawed" = drew . 54. "Leave me alone" (let). 56. "dreuve = drove. 57. "Swang" = swung; "teached" = taught. 64. "Lie her down" = lay her down. 65. "Dag" = dig. Many other irregular forms are used in place of regular, even after this time, but no further record was made of coined regular forms.

A few words or sentences follow showing the development of grammatical appreciation. 44. "I don't say brang any more:

I say brought." 47. Some one said "I done." G. at once said, "You shouldn't say done; you should say did." 52. G. used the word "thinked," but at once, without prompting, changed it to thought." 63. "Be" was incorrectly used, and at once changed to the correct form "are." 65. "Lied" was at once changed to "lay."

The imperative is the first recognizable attempt at a verb. 9. " Ha" (hark) is much used, but is hardly distinguishable in early speech from an exclamation. Many imperatives are correctly used almost from the beginning of articulate speech. The infinitive is more difficult. 31. "I want see." for "I want to see." But it is often correctly used. 34. "She ought not to get fat." "She have (will have) to light a lamp." The subjunctive appears in such sentences as; 24. "Kitty might bite." 34. "She ought not to get fat."

The singular and plural forms are often mixed, as, 29. "Come in here where G. are." 31. "I hasn't." "I doesn't." . 33. "I wants." "I has." 35. "I were." 36. "Were I?" = Was I?

An object is often described in terms of its action, as, 24. a bicycle pump is called a "blowin' thing." 43. "Weigher" is used in speaking of a scale.

35. G. frequently repeats a thing said by one person, changing all forms from first to third person, and usually making them grammatically correct.

Attempts at sentences are found as early as 13. "Papa go cool (school)." "Doggie cryin'." By the 20th month frequent short and usually imperfect sentences are used. 29. Sentences are now longer and grammatically complete, as, "Don't that beat the Dickens?"

Contractions occur early, 19. "That's the way." 31. "I hasn't;" "I doesn't." 33. "I wants;" "I has." The verb is often thus contracted with a subject or an abverb. This contraction usually follows, in point of time, the use of the full grammatical form. 35. "Don't." 39. "You oughtn't to'v doin' that."

TOPICAL ANALYSIS.

ADJECTIVES

As with nouns and other parts of speech, adjectives are not well differentiated until the sentence begins to assume grammatical form. Many expressions are used as both nouns and adjectives, or adjectives and adverbs interchangeably. The word pretty, used as early as the twelfth month, and probably before, is the first clearly and distinctly articulated word, but it was several months before it was indisputably used as an adjective.

20. Counting was observed when G. placed two dolls together and said repeatedly, "Two dolly.". In this month when some one counted each of three little girls in a picture, G. would point to one after another as if counting, but did not say the words. The words three, four, five are recorded in the 21st month, six and eight in the 25th; seven, nine and ten in the 29th. The idea of plurality is shown, 24. by "Lots of tomachs" (stomachs,) and G. can certainly count two. During the third and fourth years G. practices counting objects, and about the 48th month can count to twenty, by the 64th month she can count 20 objects and say the words in order to one hundred.

24. G. drank some lemonade and said, "Very sour." 30. "Warmy is used for warm by analogy with nouns having the diminutive ending. Comparison causes difficulty. The attempt to use the regular forms frequently results in double comparison or in the wrong form, as, "beautifuller" in the 32nd month, "most cleanest," in 43rd, "more warmer," 54th, "more hard," 69th, patienter," 71st. Adverbs and adjectives are long confused, as, 32. "possible" = possibly.

Some rather abstract ideas are expressed, as, 39. "invisible," 41. "portant," "porkant," (important), are used correctly in sentences. 55. "Purty" for pretty is a good illustration of deterioration, as this was the first word perfectly articulated.

SPEECH DEVELOPMENT.

ADVERBS.

The first adverb recorded is no, in the 13th month. It is much oftener used than yes, which seldom is used before the 34th month. Before this time a question is answered by repeating the entire question in statement form. In the 36th month the grunting noise, "uh, uh," is taking the place of yes; it has almost displaced yes in the 37th month, though great effort was made to combat the practice. About the same time the colloquial substitute for no, "ung, ung," appears and largely takes its place. The double negative was observed in the 45th month, "I won't eat no more," an error probably never heard by G.

31. "Why (what) did you do that for?" shows confusion of adverb and pronoun. Among early adverbs used are, "Leave the door open." "He had to bind it up." 50. Such adverbs as, "simply," and "absolutely," are correctly used in sentences. In the sixth year G. developed the habit of prefixing "why" to statements. No amount of correction has served to abate this error. It is very hard to combat a mistake which requires a negative rather than a positive command.

PRONOUNS.

Next to verbs, pronouns (41:308) probably cause children most trouble to use correctly (76:178). Persons and gendenrs are more troublesome than number (88:13). The personal pronouns are fairly well sued by the 29th month, "They fit on me," though the relatives are still confused, (29) "Who's his name?" (15:69).

A list of the pronouns recorded with the month in which each was noticed (32:71); (55:436).

I (21	you (30)	he (29)	she (30)	it (22)
my 21)	your (30)	his (29)	hers (*)	its (30)
mine (21)	yours (34)	him (22)	her (29)	
me (13)			they (29)	
we (22)			their (30)	
our (30)			theirs (*)	
ours (*)			them (29)	
us (*)				
myself (30)	yourself (*)	himself (29)	herself (29)	
itself (*)	ourselves (*)			
who (20)	whose (*)	this (21)		
which (31)	whom (*)	these (29)		
what (22)		those (29)		
that (21)				

Though most, if not all the starred (*) forms were used almost certainly by G. during the period of observation, it happens that no record was taken which contains these words. The recorded vocabulary is a minimum: the maximum, if known would probably run up the total of recorded words by a good percentage.

29. "He's sick in her froat (throat)" was at once spontaneously corrected to his froat. A sentence was begun, "Your finger," but at once spontaneously changed to the proper form, my finger.

The correct use of the third person generally precedes that of the first and second persons. The second is often used incorrectly in place of the first, "Mamma, rockabye you." Often the first person is confused with the second or third in the same sentence. Special pains were taken to teach the correct forms but they appeared nevertheless to be puzzling (8:144).

Cases present less difficulty (29) than gender and person. I and me are usually correctly used. (30) "We'll have herself" (ourselves), but "I'm shaving myself," (formerly, 'herself.')

(31) The distinction between first and second person is now fairly well made. "What's my name?" in response to the ques-

tion, "What's your name?" "Girl got mark on his nose," shows confusion of gender, which is not always well distinguished. Herself is still used for himself. The second person is now fairly well distinguished (31:599).

Singular and plural in the case of relatives is not discriminated; "Those vocabulary." (34) Few mistakes occur now among personal pronouns. Cases are usually correct. Relatives still trouble some; "These sort wouldn't."

(36) "You and me" (you and I).

(38) No errors recorded.

(46) "Of I" = of me; probably due to analogy.

(47) When a test was made by saying to G. "Shave herself," she said, "You mustn't say her; say shave myself."

(50) "Is that him?," a case of objective after forms of the verb be by analogy, showing that him is recognized as the correct form for the object of a verb. Such mistakes as this show that a child is using reasoning power and applying things already learned to new uses. The correct use of pronouns is one of the most difficult features of English for the child to master. These difficulties are nearly conquered before the end of the fifth year.

OTHER PARTS OF SPEECH.

Thirty-three prepositions are recorded, most of them in the last three years. A few are compound; "I can reach from up there."

The articles were first recorded as follows: (19) the; (25) a; (29) an, (48:129). After the 30th month the distinction between "a" and "an" is correctly made.

Interjections (31:598) and exclamatory words are hardly distinguishable at first from other parts of speech. (20) "My oh me!" "hark, boy!" (when a boy outside was whistling). As grammatical sentences develop, the parts of speech are differentiated (17:65.)

TOPICAL ANALYSIS.

SENTENCES.

Single words may be abbreviated sentences (8:141). With children and the race the sentence precedes words. (16:294). Gestures may take the place of sentences (41:303). But to elaborate a complete grammatical sentence is a later process and a higher act of mind than to use single words (1:414). Word order is determined by necessity rather than by logic (8:145).

The first noted attempts made by G. to form sentences are recorded in the 18th month: "Papa go cool" (school). "Arm, cut, cut." "Chickie says, 'Peep, peep.' "

29. Usually a question must be repeated several times before it is answered, and the answer, when given, comes after much deliberation if there is any indecision or perversity. 36. Formerly questions were usually repeated in the answer, but now they are usually answered by yes or no, or in some other short way (48:130). These observations seem to prove that the unit of thought, for the child, at least, is the sentence, rather than the word. The sentence may be intelligent or intelligible even when the meaning of one or more component words is hazy (32:38).

ELISIONS AND OMISSIONS.

Initial and final letters (sounds) are often omitted in early stages because of difficulty; later, as a result of imitation, laziness or perversity, 18. "no" (snow). 29. Final g of ing is usually elided, except in words of one syllable. Long words, as vocabulary, are usually abreviated in some way, not always the same, as, "cabus," "cabelary," "vo," etc.; "pempernt (peppermint); 37. "high" (high chair); "po" (potato); "cin" (cinnamon bun). Such forms are largely decayed forms, derived from earlier correct forms. 38. "Comftable" (comfortable). 70. "Noceros" (rhinoceros).

SPEECH DEVELOPMENT.

Phonetic decay by abbreviation at the beginning or end of a word is shown in Teutaryan speech (6:805).

The common provincial slurring of final syllables and the weakening of unaccented vowels was quickly imitated when heard by G., although she often noticed and corrected errors of grammar and enunciation committed by others, as, 48. "You shouldn't say done; you should say did." "Jessie says dink of water; G. can say drink of water." 34. "Preston says brack pomy for black pony."

Many Dutch expressions were picked up from playmates when on visits, as, 39. "I want down" (to go down); "Let's look in the enlope once." These were never heard at home, but were retained for a long time in spite of all attempts to eradicate them.

G's enunciation was excellent about the thirtieth month, but after this it began to deteriorate, and became so much poorer a year later as to be remarked by every acquaintance (23:111).

SELF CONSCIOUSNESS.

A child could not be the subject of observation and experiment for so many years without becoming self conscious (15:61). This is shown by the attitude and the remarks on many occasions. (31) "I must write in my vocabulary." (38) "Are you writing my name?" (45) Curiosity is frequently shown as to the records made: "Papa's writing down my words." G. obtained a small book and after looking intently for a time at her doll, said, "She said something," and pretended to write it in the book. (46) While records were being made G. said, "I'm just saying that for fun." (64) "Are you writing in it because I'm talking?" (67) Self-consciousness often takes the form of reluctance to say things for record, "Here don't you write that down!" or a tendency to nonsensical combinations of words or sounds. (69) "Now is the time I want you to write just what I say." (71) The disinclination to talk for record purposes grows and often proves a bar to obtaining adequate records. "Why are you writing in my vo?" "I'd better talk an awful lot."

Summary

One may not generalize from the results of a single experiment, but these results may serve as a check upon those derived by an entirely different method of procedure, or where the records have not extended over so long a time. Tracy (83a:126) gives a tabulation of 5400 words recorded in the case of an experiment made upon 25 school children. This shows that 60% were nouns, 20% verbs, 9% adjectives and 5% adverbs. A comparison is made with the English language which has 60% nouns, 11% verbs, 22% adjective and 5% adverbs. G. has 61% nouns, 20% verbs, 11% adjectives and 3.9% adverbs. Other investigations show similar proportions (48:130), (10:163).

If the six year old child has a vocabulary of 3,000, or even 1,000 words, it is unnecessary to limit the first reader to so scant a vocabulary as 200 words, as is sometimes advocated.

Gale says that the guesses of philologists are ridiculously small (22:277). "When will makers of primers for six year old children cease to construct their books as though meant for babies of 18 months, as to range of thought and vocabulary."

Taylor considers (79:87) "that the knowledge and the vocabulary of a child grow at approximately the same rate, revealing the function of language in language-getting." Doran (18:431) adds, "The child's words are stepping stones to knowledge, and represent the ability to get knowledge, whether or not they represent so much knowledge. From this we may be justified in concluding that the teacher should consider the facility of language of the child an important criterion for promotion, particularly in the primary grades."

Doran (18:402) summarizes the results of available studies of children's vocabulary and believes that these are usually larger than generally supposed. He mentions one girl (18:404) who was

estimated at the age of two years to know from 4,000 to 5,000 words, and who actually proved to a committee that she knew at least 2,500 nouns.

Most of the words used by G. have been learned incidentally by her without special effort to give her an abnormally large vocabulary. If such effort were made no doubt the number of words used could have been materially increased, especially in the case of concrete nouns. Unquestionably these experiments have tended to increase her vocabulary in an indirect way. She frequently would say, "I'll tell papa what that is," pointing to some object. Later, when self consciousness had developed, she would often refuse to say anything for record. These experiments on vocabulary as well as others made upon number ideas indicate that a child, if given the opportunity, will learn just about as fast as the normal development of the brain will allow, and that any effort to force the child beyond its capacity will be futile. In the case of the number experiments persistent efforts were made to teach certain things, but without success.

Very little baby talk has been used (8:123), and the enunciation has been good, when pains have been taken to correct errors, up to nearly the thirty-sixth month. When parents adopt or encourage baby talk, it may serve to fix this in the child's vocabulary and cause at least a temporary retardation. About the thirty-sixth month a marked deterioration in enunciation began in spite of all efforts to prevent. This had not disappeared when the seventy-second month arrived and the records ceased. Now in the 112th month the enunciation has become nearly, if not quite normal again, though there is still noticed a tendency to baby talk whenever there is a baby or very young child around.

This record deals only with such words as are used spontaneously by the child. Direct imitation and physiological memory have been excluded in recording words. Even this is artificial, for this investigation certainly shows that the unit of thought is not the word but the sentence (84:129). The sentence precedes the word with the child and race (8:143). Single words may be

abbreviated sentences (8:141). It is to be expected that some words, particularly nouns, will be better understood than others (32:53), as abstract or relational terms, yet these are frequently and quite correctly employed, as is shown in many sample sentences given. With children as with adults, no doubt many words are used in the spoken vocabulary which are not completely understood (22:422), but it is difficult, if not impossible, to discriminate in every case (32:53). In certain instances words, seemingly far beyond the understanding of the child, are used with accuracy. To exclude words that have fallen into disuse would be very difficult, also. We cannot tell when the word might reappear after lying dormant weeks or months. This is especially true of nouns, as names of people or places, as is shown in more than one instance in this investigation. Words of nursery rhymes are included when the thought seems to be understood. The effort to determine whether a child understands the meaning of a word frequently results in teaching the meaning.

G. was not precocious (13:51), but rather slow in learning to talk, when compared with some other children of her age. But she made fairly rapid progress when she was well started, and by the thirtieth month she had probably as well equipped a vocabulary as most children of that age (7:904). In the thirty-eighth month almost any word could be remembered as the name of some object; not so easily if not connected with some concrete thing (32:113). The child's great desire seems to be to have things named, to know "what it is," and a name, even if meaningless, seems to satisfy the child, temporarily, at least. Now, at nine and one-half years, she is in the fourth school year and is especially good in reading.

The records show that, during the period of observation, at least 3,384 words were used (17:63), (67:257), (10:160); that 88.47% of these were of Saxon origin (14:14), 10.19% of foreign, chiefly Latin, origin, and 1.33% were inventions (42:67); that 61.07% were nouns (48:130), 20.01% verbs, 11.82% adjectives. 3.9%adverbs, and the remainder, 3.2% were distributed among the

other parts of speech; that 7.74% were proper nouns, 12.03% compound nouns and 4.16% mispronounced words, that is, words which evidently could not be correctly pronounced (67:257).

No was learned early, at least by the 21st month (10:264). Yes was used later, hardly before the 34th month. There was no trouble with the pronunciation, she simply seemed to have no use for the word.

Next to irregular verbs, pronouns were the greatest difficulty. Cases of pronouns seemed easiest, numbers harder, and persons and genders hardest. The forms of inflection of verbs are learned, at first, as individual cases, and some time elapses before similar forms are built up by analogy, when, naturally many mistakes are made with irregular verbs (31:597). We can judge of the progress of the child's mental growth by these mistakes (51:45). The child's instinct is to simplify forms, to get rid of irregularities (84:133), though many errors seem due to the child's enjoyment in peculiar forms, power of invention, imitation, and to habit due to a former lack of power.

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